

CLAIMS

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1. A combustion apparatus comprising:

an annular container having an inner cylindrical portion forming an inner circumferential side surface, an outer cylindrical portion forming an outer circumferential side surface, an open end, and a close end;

an air supply portion for supplying combustion air into said annular container so as to have a velocity component in a direction of a central axis of said annular container from said open end to said close end of said annular container; and

10 a fuel supply portion for supplying fuel into said annular container so as to have a velocity component in the direction of the central axis of said annular container from said close end to said open end of said annular container,

wherein a flow of the combustion air supplied into said annular container first crosses a track of the fuel at a region away from said fuel supply portion and then crosses 15 the track of the fuel again at a region near said fuel supply portion.

2. A combustion apparatus comprising:

an annular container having an inner cylindrical portion forming an inner circumferential side surface, an outer cylindrical portion forming an outer circumferential side surface, an open end, and a close end;

an inflow passage for supplying combustion air into said annular container, said inflow passage being formed at a location away from said close end in a direction of a central axis of said annular container so as to extend through said outer circumferential side surface of said annular container; and

25 a fuel nozzle provided inside of said close end of said annular container for supplying fuel into said annular container,

wherein said inflow passage is configured so as to form a flow of the air with a velocity component in the direction of the central axis of said annular container from said

open end to said close end and a velocity component to swirl in a circumferential direction of said annular container,

wherein said fuel nozzle is configured so as to inject the fuel toward said inflow passage with a velocity component in the direction of the central axis of said annular container from said close end to said open end and a velocity component directed radially outward.

3. A combustion apparatus comprising:

an annular container having an inner cylindrical portion forming an inner circumferential side surface, an outer cylindrical portion forming an outer circumferential side surface, an open end, and a close end;

an inflow passage for supplying combustion air into said annular container; and
a fuel nozzle for supplying fuel into said annular container,

wherein said outer cylindrical portion has a portion having a reduced diameter at a location away from said close end along a central axis of said annular container by a predetermined distance,

wherein said inflow passage is formed at said portion having a reduced diameter in said outer cylindrical portion and is configured so as to form a flow of the air with a velocity component in the direction of the central axis of said annular container from said open end to said close end and a velocity component to swirl in a circumferential direction of said annular container,

wherein said fuel nozzle is configured so as to inject the fuel toward said inflow passage with a velocity component in the direction of the central axis of said annular container from said close end to said open end and a velocity component directed radially outward.

4. A combustion apparatus comprising:

an annular container having an inner cylindrical portion forming an inner

circumferential side surface, an outer cylindrical portion forming an outer circumferential side surface, an open end, and a close end;

a cylindrical member disposed substantially coaxially with a central axis of said annular container and positioned on said open end side of said outer cylindrical portion,
5 said cylindrical member having a diameter smaller than that of said outer cylindrical portion;

an annular connecting member connecting an end of said outer cylindrical portion and an outer circumferential surface of said cylindrical member to each other;

10 an inflow passage formed in said connecting member for supplying combustion air into said annular container; and

a fuel nozzle provided inside of said close end of said annular container for supplying fuel into said annular container,

wherein said inflow passage is configured so as to form a flow of the air with a velocity component in the direction of the central axis of said annular container from said
15 open end to said close end and a velocity component to swirl in a circumferential direction of said annular container,

wherein said fuel nozzle is configured so as to inject the fuel toward said inflow passage with a velocity component in the direction of the central axis of said annular container from said close end to said open end and a velocity component directed radially
20 outward.

5. A combustion apparatus comprising:

an annular container having an inner cylindrical portion forming an inner circumferential side surface, an outer cylindrical portion forming an outer circumferential side surface, an open end, and a close end;
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an annular member disposed substantially coaxially with a central axis of said annular container and positioned on said open end side, said annular member having an inner cylindrical portion forming an inner circumferential side surface and an outer

cylindrical portion forming an outer circumferential side surface and having a diameter smaller than that of said outer cylindrical portion of said annular container;

5 a first connecting member connecting an end surface, on said open end side, of said outer cylindrical portion of said annular container and an outer circumferential surface of said outer cylindrical portion of said annular member to each other;

 a second connecting member connecting an end surface, on said open end side, of said inner cylindrical portion of said annular container and an end surface of said inner cylindrical portion of said annular member to each other;

10 an inflow passage formed in said first connecting member for supplying combustion air into said annular container; and

 a fuel nozzle provided inside of said close end of said annular container for supplying fuel into said annular container,

15 wherein said inflow passage is configured so as to form a flow of the air with a velocity component in the direction of the central axis of said annular container from said open end to said close end and a velocity component to swirl in a circumferential direction of said annular container,

20 wherein said fuel nozzle is configured so as to inject the fuel toward said inflow passage with a velocity component in the direction of the central axis of said annular container from said close end to said open end and a velocity component directed radially outward.

6. The combustion apparatus as recited in any one of claims 2 through 5, wherein an additional inflow passage is provided in said inner cylindrical portion of said annular container for supplying air into said annular container.

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7. The combustion apparatus as recited in any one of claims 2 through 6, wherein an additional inflow passage is provided on said close end at a location near said inner cylindrical portion of said annular container and is positioned radially inward from said

fuel nozzle so that air flows in the direction of the central axis of said annular container.

8. The combustion apparatus as recited in any one of claims 2 through 7, wherein
an additional inflow passage is provided in said outer cylindrical portion of said annular
5 container for supplying air inwardly in a radial direction of said annular container.

9. The combustion apparatus as recited in any one of claims 2 through 8, further
comprising a flow adjusting structure disposed on said close end within said annular
container and/or on said outer cylindrical portion of said annular container near said close
10 end for suppressing a swirling flow of the air near said close end.

10. The combustion apparatus as recited in any one of claims 2 through 8, further
comprising a flow adjusting structure disposed on said close end within said annular
container and/or on said outer cylindrical portion of said annular container near said close
15 end for converting a flow of air having a velocity component in a direction of the central
axis of said annular container from said open end to said close end and swirling in a
circumferential direction of said annular container into a flow directed inwardly in a
radial direction of said annular container near said close end.

20 11. The combustion apparatus as recited in any one of claims 2 through 10,
wherein an additional fuel nozzle is provided at a location closer to said close end than
said inflow passage with respect to the direction of the central axis of said outer
cylindrical portion of said annular container.